REMARKS

Reconsideration of the Application is requested. Applicants have amended the claims to place the application in condition for allowance or for better condition for appeal. The amendment does not create any undue burden for the Examiner.

Drawings

The Office Action objected to the drawings. Applicants hereby include drawings which are believed to have uniformly thick and well defined lines of good quality. Reconsideration is requested.

Rejection Under 35 USC 103

The Office Action rejected Claims 26-50 under 35 USC 103 over U.S. Pat. No. 3,832,034 (Edmonds) in view of U.S. Pat. No. 5,117,071 (Greanias). The rejection should be withdrawn in view of the remarks below.

To establish a *prima facie* case of obviousness, the USPTO must satisfy all of the following requirements. First, the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or to combine references. *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Second, the proposed modification must have had a reasonable expectation of success, as determined from the vantage point of one of ordinary skill in the art at the time the invention was made. *Amgen v. Chugai Pharmaceutical Co.* 18 USPQ 2d 1016, 1023 (Fed Cir, 1991), *cert. denied* 502 U.S. 856 (1991). Third, the prior art reference or combination of references must teach or suggest all of the limitations of the claims. *In re Wilson*, 165 USPQ 494, 496, (CCPA 1970). The Office Action did not establish a *prima facie* case of obviousness.

Applicants' invention relates to a display device with a touch sensor comprising (a) a transparent cover plate, (b) a transparent support plate and at least one photodetector that is mounted on the support plate and that has a photosensitive solid angle range so that the support plate lies in the photosensitive solid angle range, (c) an electrochromic cell or a liquid crystal cell located between the transparent cover plate and the transparent support plate, and (d) a radiation source

arranged on at least one end face of the transparent cover plate. Applicants' invention also relates to a method that involves touch recognizing Applicants' display device so that radiation from the radiation source periodically varies with time at the frequency, and the electric signal from the photodetector is further processed so that predominantly only that part of the signal which likewise varies periodically with time and approximately varies at the same frequency as the radiation power from the radiation source is evaluated. Applicants' invention can be used in applications in which touch screens are used. As discussed on page 1, third full paragraph, touch screens are predominantly used as input devices and display pictures, e.g., explicatory texts.

The Office Action alleged that the a touch sensor is only in the preamble and that "[a]lthough the claims are interpreted in light of the specification, limitations from the specification are not read into the claims." The preamble is part of the claims and the language in the preamble should be construed as a limitation. MPEP 2111.02, for instance, expressly states that "a claim preamble has the import that the claim as a whole suggests for it." The MPEP expressly states that "[i]f the claim preamble, when read in light of the context of the entire claim, recites limitations of the claim, or, if the claim preamble is necessary to give life, meaning, and vitality to the claim, then the preamble should be construed as if in the balance of the claim."
As such, it was wrong for the Office Action to ignore the preamble. Regardless, Applicants amendments above expressly place the touch sensor in the body of the claim. With that said, Applicants respond to the Office Action.

Edmonds does not teach a display device with a touch sensor. Edmonds teaches a liquid crystal cell in which one pair of opposed space electrodes is circumscribed by a dielectric shield or mask having a hue, chroma and brightness substantially the same as the color of either the circumscribed electrode or of the scattered state of the liquid crystal material disposed between electrodes (See Abstract). Edmonds was based on the discovery that a liquid crystal display can be operated in a two-color fashion by circumscribing the back or reflecting the electrode with a dielectric color shield having a hue, chroma and brightness substantially matching either the color of the back electrode or of the reflected color induced by

the scattering of the liquid crystal material (See. Col. 1, ll. 58-64). Edmonds teaches that one particularly desirable shield for such purpose is an anodized film of aluminum which can be suitably dyed by conventional means for color matching (See Col. 1, ll. 64-68).

One of ordinary skill in the art following Edmonds would not have been motivated to modify Edmonds and make or practice Applicants' invention. Edmonds does not teach a display device with a touch sensor. The Edmonds liquid crystal is structurally and functionally different from Applicants' invention and in no way teaches a structure even remotely similar to a display device with a touch sensor comprising (a) a transparent cover plate, (b) a transparent support plate and at least one photodetector that is mounted on the support plate and that has a photosensitive solid angle range so that the support plate lies in the photosensitive solid angle range, (c) an electrochromic cell or a liquid crystal cell located between the transparent cover plate and the transparent support plate, and (d) a radiation source arranged on at least one end face of the transparent cover plate. Further, Edmonds does not teach the other embodiments encompassed by Applicants' invention. Reconsideration is requested.

The Office Action did not recognize that Edmonds does not provide the necessary technical information that would have taught one of ordinary skill in the art how to convert the touching of the display surface into an electrical signal and make or practice Applicants' invention. Edmonds teaching, for instance, that its liquid crystal cell has one pair of opposed space electrodes circumscribed by a dielectric shield or mask having a hue, chroma and brightness substantially the same as the color of either the circumscribed electrode or of the scattered state of the liquid crystal material disposed between electrodes would not have motivated one of ordinary skill in the art to modify Edmonds and make a display device with a touch sensor comprising (a) a transparent cover plate, (b) a transparent support plate and at least one photodetector that is mounted on the support plate and that has a photosensitive solid angle range so that the support plate lies in the photosensitive solid angle range, (c) an electrochromic cell or a liquid crystal cell located between the transparent cover plate and the transparent support plate, and (d) a radiation source arranged on at least one end face of the transparent cover plate.

Similarly, Edmonds' discovery that a liquid crystal display can be operated in a two-color fashion would have been similarly lacking in any meaningful guidelines. One of ordinary skill in the art dealing with touch sensors would not have considered this document. Edmonds teaching that one particularly desirable shield is an anodized film of aluminum which can be suitably dyed by conventional means for color matching would not have provided the requisite information to enable one of ordinary skill in the art to modify Edmonds and make or practice Applicants' invention. Reconsideration is requested.

Greanias fails to overcome the deficiencies of Edmonds. In fact, Greanias simply lacks any teaching that would have made one of ordinary skill in the art modify Edmonds and make or practice Applicants' invention. Applicants' submit that one of ordinary skill in the art would not have been motivated to combine Edmonds and Greanias as alleged by the Office Action.

Greanias teaches a liquid crystal display on which two layers of conductors are arranged vertically to each other and in isolation from each other (Figs. 1, 2 and 3). These conductors are made of ITO and are connected to an external bus. The so-called "stylus" (cf. Fig. 4) evidently merely contains an electrical contact between the "antenna" 50 and the cable 22. The "light pen" referred to by the Examiner is thus in no way associated with light. The conductors are evidently supplied with an oscillating voltage (40 kHz, cf. Fig. 13a). Depending on how the crossed conductors are switched, the position of the "stylus" can be determined via the electrical signal ("capacitance measurement", Claim 1).

The device described by Greanias does not use light (as according to Applicants' invention) but variations in capacitive electrical resistances. In Applicants' invention, Applicants' use, *inter alia*, a conventionally designed liquid crystal cell. Light is injected into the cover plate. A light detector is located beneath the support plate. This detector normally does not receive any light, since this remains in the cover plate due to total reflection. On touching the cover plate with one finger the light is coupled out and scattered back by the finger. It then passes through both plates vertically to the cell and impinges on the detector which then produces a signal. The position of the finger on the cover plate can be determined when a large

number of detectors having a very narrow angle of incidence for the light to be detected are located beneath the support plate. The problem to be solved - namely the indication of the position of, for example, a finger - thus takes place electrically in the Greanias patent and optically in Applicants' invention.

Greanias teaches a touch overlay that was intended to provide (i) an interactive stylus input device for freehand drawing, handwriting, and gestures, that can also be used to select items by finger as well as stylus, (ii) very precise contact detection when using the stylus, (iii) a stylus and touch sensor display system, and (iv) accurately determine stylus location independent of the angle at which the stylus is held (See Column 3, lines 51-63). The Greanias touch overlay has a array of horizontal and vertical conductors, a control microprocessor, a stylus antenna, a radiative signal measuring means to measure stylus input, a capacitive measurement means to measure finger input, a radiative source to drive the conductors and a switchable path to connect the conductors to the radiative source, the radiative signal measuring means and the capacitive measuring means in response to control commands by the control microprocessor.

Greanis does not bridge the gaps that separate Edmonds from Applicants' invention. The Office Action alleged that it would have been obvious to utilize a radiation source and an optical detector as taught by Greanis in the liquid crystal display disclosed by Edmonds because this would provide a stylus and touch sensor display system which is reliable and inexpensive to manufacture. Such reasoning does not in any way show how the combined teachings of Edmonds and Greanis would have motivated one of ordinary skill in the art following Edmonds to modify Edmonds and make or practice Applicants' invention.

Greanis is fundamentally different from Edmonds. At Columns 5 and 6, Greanis refers to Fig. 1 and describes a touch workpad housing 12 having a rectangular recessed window 14 which surrounds the edges of a rectangular touch overlay 16. The overlay 16 is transparent and is disposed on a liquid crystal display (LCD) 18. Greanis teaches the overlay 16 consists of a laminate structure including several plastic substrate layers laminated together by means of adhesive layers also including a first plurality of transparent conductors 16A disposed in the horizontal

direction and a second plurality of transparent conductors 16B disposed in the vertical direction. According to Greanis, several of the conductors in both vertical and horizontal directions are positioned beyond the recessed window 14 to allow more accurate location determination of the stylus 20 or a finger on the LCD 18 at the edges of the display window 14. A stylus 20 is connected by cable 22 to the touch workpad. Greanis explains that the stylus 20 acts as an antenna to pick up the signals radiated by the overlay 16, and provides much greater resolution than can be provided by a finger touch.

One of ordinary skill in the art would have realized that the Greanias touch overlay would be different from the Edmonds liquid crystal cell--a cell in which one pair of opposed space electrodes is circumscribed by a dielectric shield or mask having a hue, chroma and brightness substantially the same as the color of either the circumscribed electrode or of the scattered state of the liquid crystal material disposed between electrodes.

Needless to say, the alleged combination would result in a structure that is fundamentally different from Applicants' invention. According to Applicants' invention, Applicants' device is structured so that the touching of the display surface is detected by measuring the light emitted by a radiation source arranged on one end face of the transparent cover system. Greanias teaches a finger touch and stylus detection system which can be used as a device for a data processing system. According to Greanias, its device detects the location of a finger touch on the screen by the change in capacitance of the overlay or alternately the location of a stylus on the screen is detected by measuring the radiative signal input of the stylus antenna (See Col. 3, l. 65 - Col. 4, l. 9). Reconsideration is requested.

As such, Greanias would not have provided one of ordinary skill in the art following the teachings of Edmonds to modify Edmonds and make or practice Applicants' invention. Applicants request that the USPTO acknowledge the differences that exist between their invention and Edmonds, singly or in combination with Greanis.

In view of the remarks above, a Notice of Allowance is earnestly requested.

Respectfully submitted,

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